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GB05/1083

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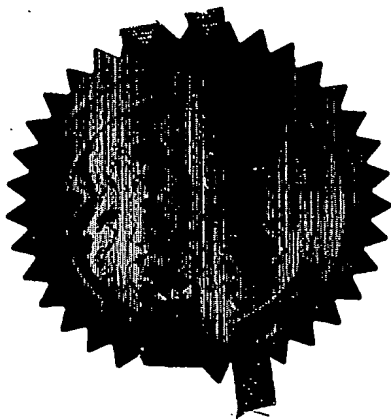
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CH-MS-G35038 NEWPORT

2. Patent application number

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0406784.9

26 MAR 2004

3. Full name, address and postcode of the or of each applicant (underline all surnames)

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Patents ADP number (*if you know it*)

8838047001

8838054001

If the applicant is a corporate body, give the country/state of its incorporation

4. Title of the invention

Gripping apparatus

5. Name of your agent (*if you have one*)

"Address for service" in the United Kingdom to which all correspondence should be sent (*including the postcode*)

Bailey Walsh & Co
5 York Place
Leeds
LS1 2SD

Patents ADP number (*if you know it*)

224001/

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Country

Priority application number
(*if you know it*)

Date of filing
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7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
(day / month / year)

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Description

7

Claim(s)

Abstract

Drawing(s)

5 + 5 RM

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Statement of inventorship and right to grant of a patent (*Patents Form 7/77*)

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11.

I/We request the grant of a patent on the basis of this application.

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C Hemingway

25/03/04

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C Hemingway
0113 243 3824

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Gripping apparatus

The invention to which this application relates is a gripping apparatus for gripping a workpiece.

Although the following description refers almost exclusively to use of a gripping apparatus for sawing wood, it will be appreciated by persons skilled in the art that the present invention can be used to hold other materials and/or for other purposes, such as filing, drilling and the like.

It is well known to use a clamp or vice for holding a piece of wood or metal in place while an operator works on the same, for example with a saw. Clamps typically have a pair of jaws mounted on a threaded member. The material is placed in the jaws, and the jaws are then moved towards each other, usually by rotating a handle to move one of the jaws along the threaded member towards the other jaw. The more the handle is rotated, the firmer the material is gripped. The tighter the thread in such an arrangement, the higher the gripping force applied to the material, as a greater rotational movement is required to move the jaw a specific distance. However, a disadvantage of a tight thread is that a large number of handle rotations is required to open and close the jaws, which is time consuming and laborious.

An example of a product which includes this arrangement is the Black and Decker Workmate (Registered Trade Mark) which typically features one or more clamps as described above mounted on a frame.

The aim of the present invention is to provide a gripping apparatus which is not laborious to operate.

In a first aspect of the invention, there is provided two or more gripping members, each mounted on support means, and pivoting means connecting the support means at a location offset from the gripping members such that the gripping members are moved towards each other to exert a grip on a workpiece positioned between the same as the ends of the support means are moved apart.

Typically, the said ends are in contact with a support surface at least during the gripping of the workpiece.

Typically movement means are provided on an end of at least one support means to engage a supporting surface.

In a preferred embodiment, a further support means are provided with resistance means to engage the supporting surface such that movement may be restricted by friction.

Preferably the resistance means includes any or any combination of rubber feet, locks, screws, bolts, weights, abrasive materials, protrusions and/or the like.

Preferably the movement means are any or any combination of wheels, rollers, bearings, slides, and or the like.

Preferably each support means includes one or more support members.

Preferably the support members are any or any combination of tubes, struts, or other resilient members and/or the like.

Typically the apparatus moves between an open state wherein the gripping members are substantially apart and the support means connected to each gripping member are closer together,

and a closed state wherein the gripping members are substantially together and the support means connected to each gripping member are further apart than in the open state.

Preferably, the apparatus assumes a closed state when placed on a supporting surface under gravity and/or when a downwards or other force is applied to the apparatus.

Preferably an open state is induced when the apparatus is lifted from the supporting surface.

This allows the apparatus to be stored in a more compact form when lifted completely off the surface.

Preferably the apparatus can be lifted without removal from the surface to allow the insertion of material between the gripping members.

Preferably the material is gripped by the gripping members when the apparatus is released and allowed to assume its natural state under gravity.

Typically the gripping force on the material can be increased by providing downwards or other force to the apparatus.

A downwards or other force may cause the support means to move apart from each other further, thereby causing the gripping members to move towards each other, thereby increasing the gripping force on the material therebetween.

Preferably the gripping members are detachably connected to the support means.

Preferably the gripping members can be provided in different shapes and materials, and are interchangeable as necessary depending on the nature of the material being held between the gripping members.

Gripping members could be provided at least partly made from materials such as rubber, wood, metal to provide different gripping characteristics. Similarly, the gripping members could be concave, convex, include recesses or be otherwise shaped to suit the material held therebetween.

Preferably the gripping members and support means are provided with attachment means and/or complimentary receiving means to allow the interengagement of the gripping members and support means.

Preferably the attachment means and receiving means are tubular, the tubes fitting together concentrically.

The attachment means may also include any or any combination of screws, nuts, bolts, latches, wedges, locks, and/or the like.

Specific embodiments of the invention are now described wherein:-

Figure 1 illustrates a front view of a gripping apparatus.

Figures 2a & b illustrate a side view of a gripping apparatus in (a) an open state and (b) a closed state.

Figure 3 illustrates several interchangeable jaws for a gripping apparatus.

Figure 4 illustrates a perspective view of a gripping apparatus in use.

Figure 5 illustrates a further perspective view of a gripping apparatus in use.

With reference to Figures 1-2b, there is illustrated a gripping apparatus 2 including jaws 12, 24 mounted on support means 4, 6. Support means 4 is pivotally connected to support means 6 via pivot 10. Support means 4 has a wheel 8 to allow the end of the support means 4 to move along the supporting surface. Equivalent movement of support means 6 is restricted by frictional interaction of rubber feet 28 with the supporting surface. Support means 4, 6 are constructed from a number of support members. A work support member 14 is provided to support material placed within the jaws 12, 24. A further support member 26 connects the support members of support means 4 and helps retain the structure of the apparatus 2.

When placed on a supporting surface, the apparatus 2 naturally rests by gravity in a state wherein the ends of the support means 4, 6 move apart until the jaws 12, 24 are together. When the apparatus 2 is lifted off the supporting surface, the support means 4, 6 move towards each other until they are together, and the jaws 12, 24 are moved apart. The apparatus 2 is easy to store in this folded condition.

In use, the apparatus 2 is placed in a supporting surface and then lifted slightly to open the jaws and enable material to be received. Material is placed within the jaws 12, 24 and the apparatus 2 is allowed to move towards its natural state by gravity, the jaws thereby closing on the material. Downwards pressure can also be applied to the material and/or the upper

surface of the jaws 12, 24 by a user as indicated by arrow 16 to increase the gripping force by the jaws 12, 24 on the material therebetween.

In more detail, as the apparatus 2 moves or is pushed down, the end of the support means 4 moves away from the end of the support means 6 as indicated by arrow 18, with a concurrent movement 20 in the opposite direction by the jaw 24 on the same support means 4, pivoting around pivot 10 as indicated by arrow 36. There is some movement 22 of the opposite jaw 12 located on support means 6 as the apparatus 2 moves down, but this movement and concurrent opposite movement of the end of the same support means 6 is limited by friction of the same with the supporting surface.

Referring to figure 3, it is shown that the jaw 12 is selectively attached to a support member of support means 6. In this example, the support member is a tubular structure and the jaw 12 is mounted on a structure including a tube with a smaller radius that fits inside the support member. A locking mechanism is not required to lock the tubes together, but may be provided by numerous known mechanisms, such as clips, bolts, screws, and/or the like.

Alternative jaws 30, 32 can be selectively fitted to the apparatus depending on the nature of the material. For example if the material was a length of timber, jaws 12 could be used. If the material was a length of rounded material such as a dowel, log or pipe, that would not be held well by jaws 12, concave jaws 32, or jaws 30 including recesses could be used. Other examples may be created as required in accordance with the material.

Referring to figure 4, a user is shown sawing a length of wood 34, gripped by the jaws 12, 24 of the apparatus 2. Typically the

user would stand on the wheeled side of the apparatus, as the sawing motion tends to create a force away from the user, and the rubber feet 28 help prevent the apparatus from moving away from the user due to this force.

Referring to Figure 5, the apparatus is shown lying on its side on the floor with the wheels 8 and rubber feet 28 in contact with a wall or other surface substantially perpendicular to the floor. A door 38 is shown gripped between the jaws 12, 24 so that it can be worked upon using a plane 40 for example. The force created by the movement of the plane 40 along the edge of the door 38 as indicated by arrow 42 helps to provide the gripping force of the jaws 12, 24 on the door 38 in a similar manner as hereinbefore described.

It will be appreciated by persons skilled in the art that the present invention also includes further additional modifications made to the device which does not effect the overall functioning of the device, such as the provision of decoration, a fabric or plastic covering to provide improved aesthetic appearance, and/or the like.

FIG 1

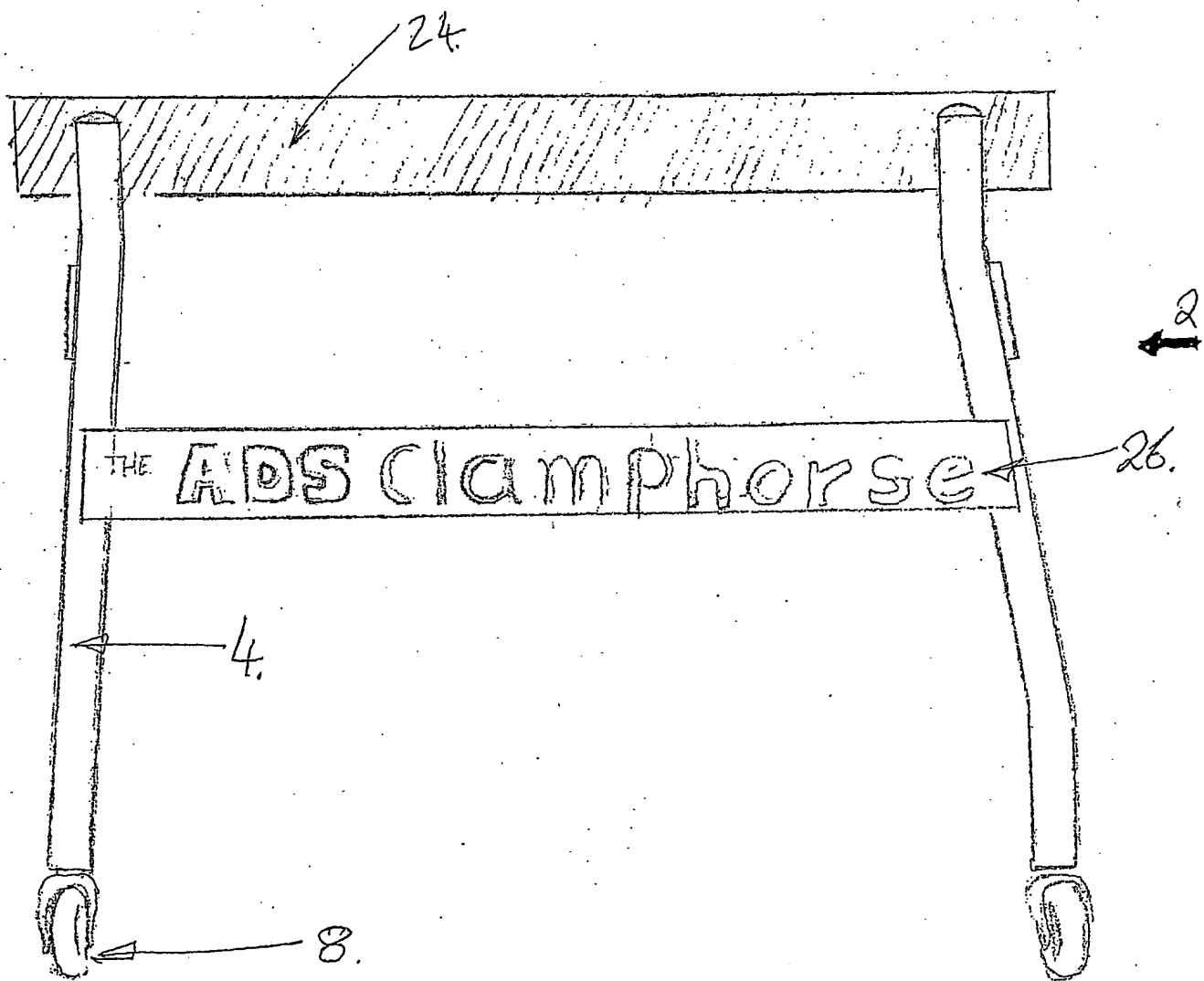


FIG 2A

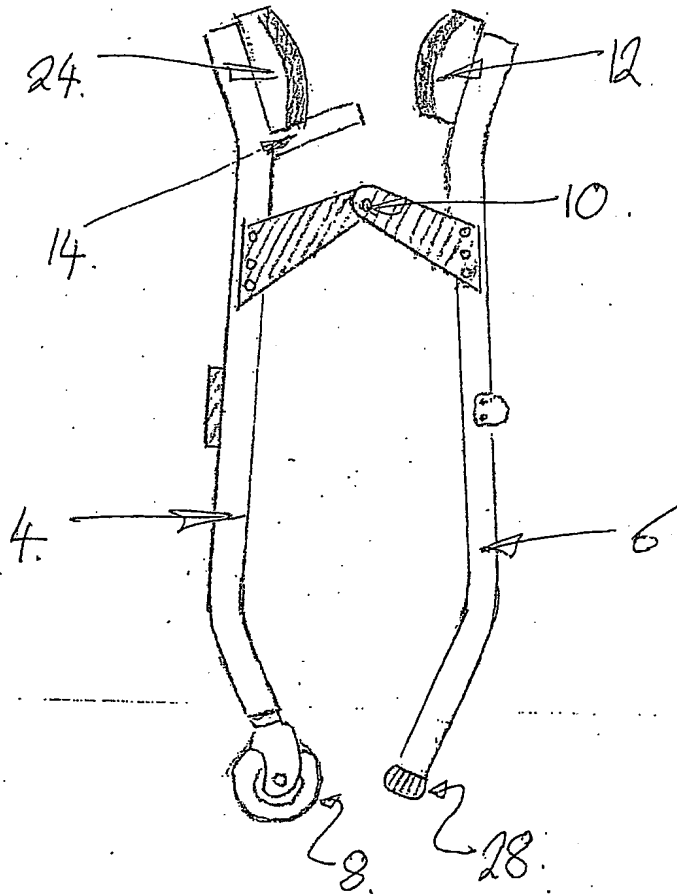


FIG 2B

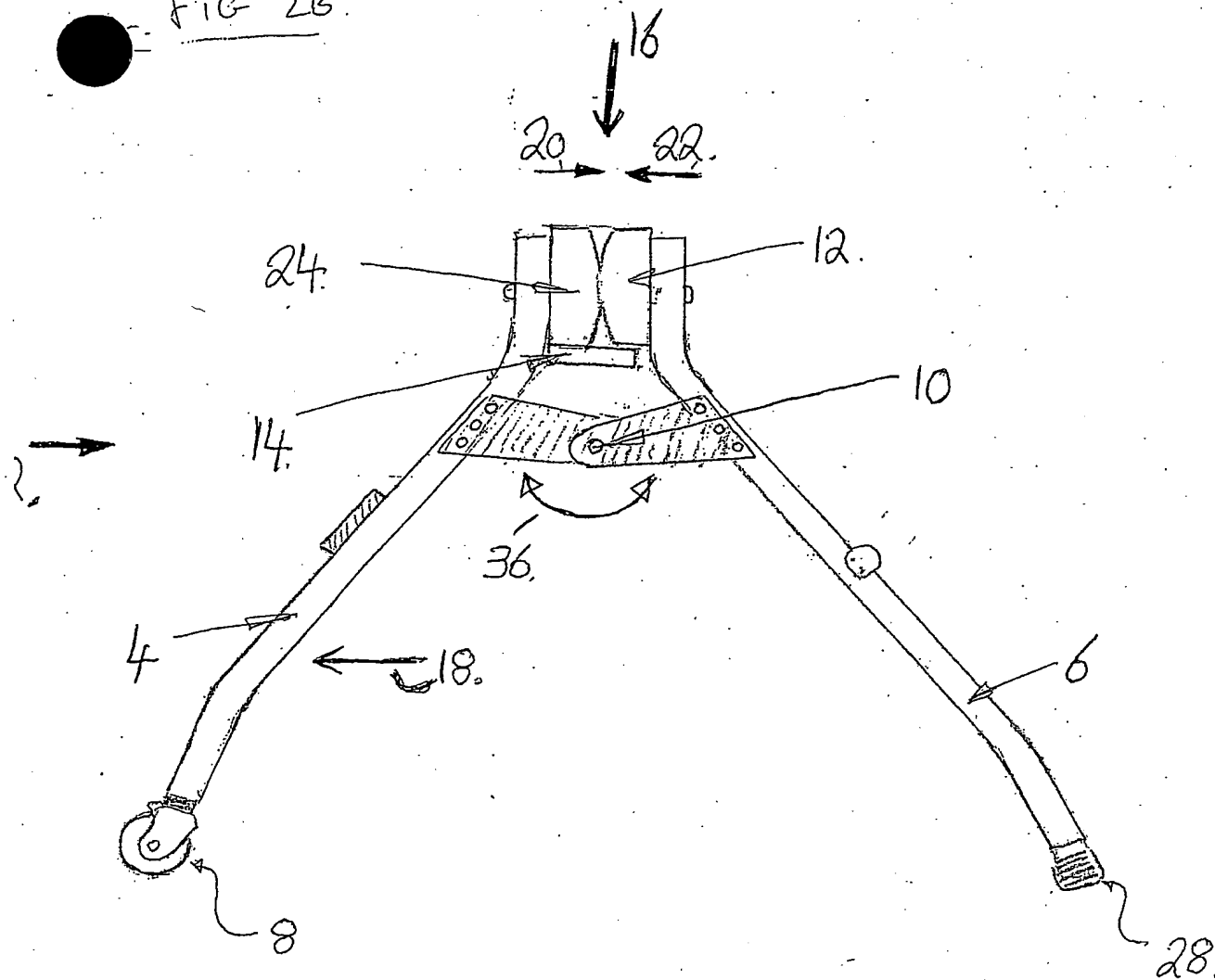


FIG 3

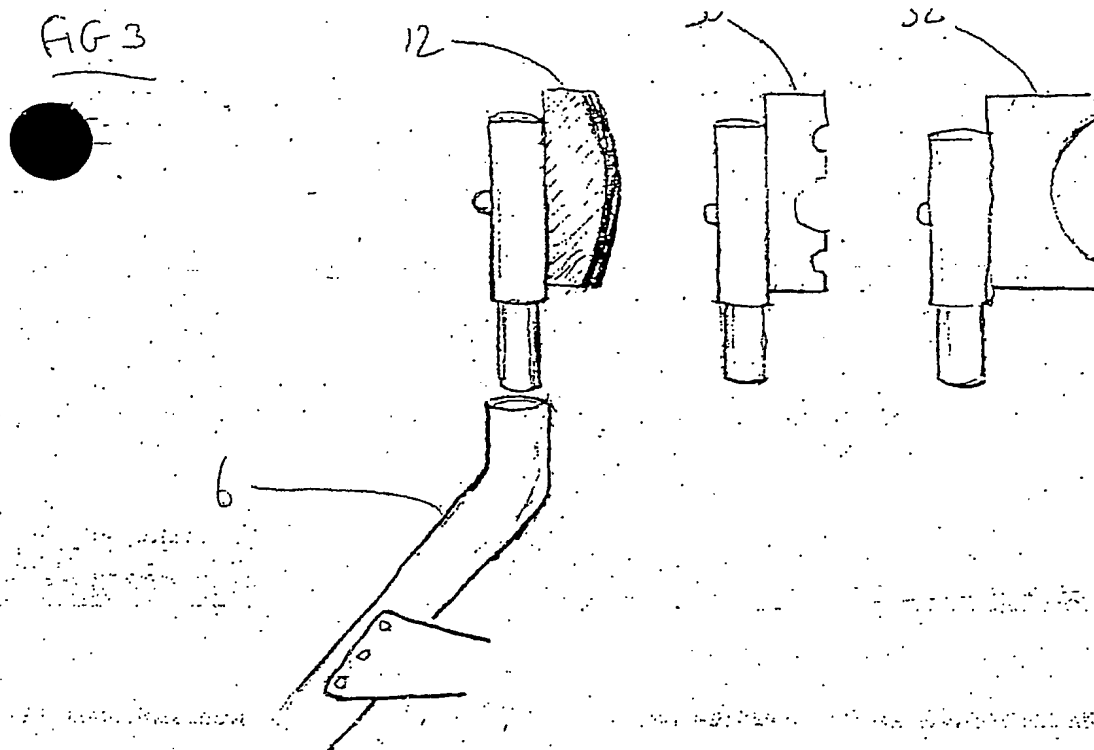


FIG 4

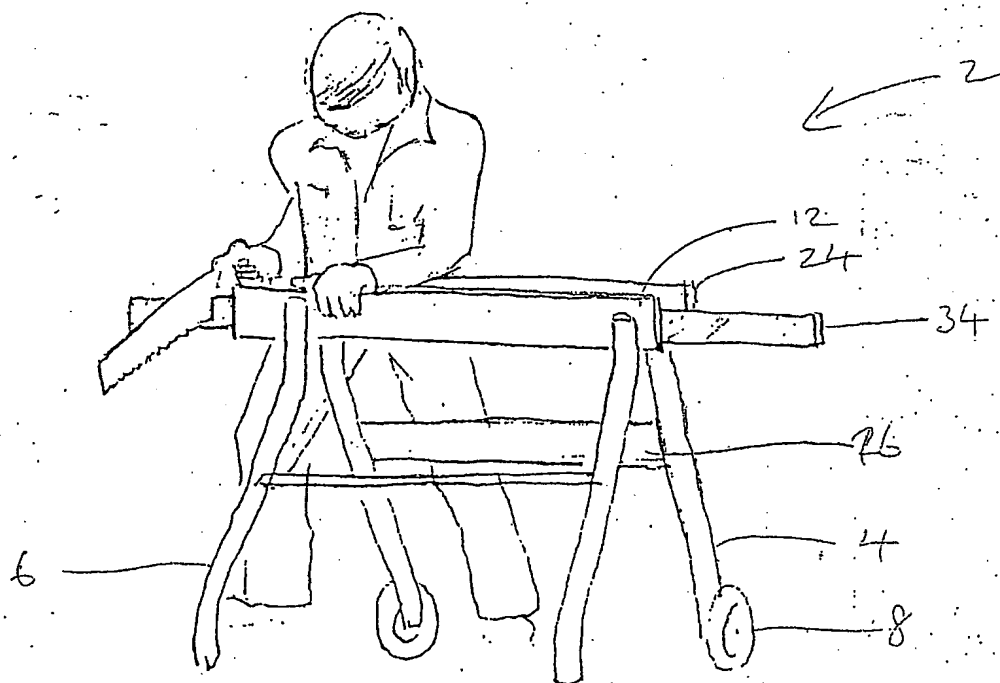


FIG 5

